

**Claims**

1. An axial flow rotary blood pump including an impeller adapted to be magnetically rotated within a housing by the interaction of magnets disposed on or in the impeller and stators disposed on or in the housing, characterised in that said impeller includes at least one support ring supporting a plurality of blades, and a hydrodynamic bearing that operates at least axially and radially in respect of an axis of rotation of the impeller.
2. The axial flow rotary blood pump of claim 1 wherein said hydrodynamic bearing exclusively suspends said impeller within a cavity.
3. The axial flow rotary blood pump of claim 1, wherein said hydrodynamic bearing is formed by angular pads.
4. The axial flow rotary blood pump of claim 1, wherein said support ring includes the hydrodynamic bearing.
5. The axial flow rotary blood pump of claim 1, wherein said support ring includes the magnets.
6. The axial flow rotary blood pump of claim 1, wherein said plurality of blades extend from the support ring towards the centre of the pump.
7. The axial flow rotary blood pump of claim 1, wherein said the blades have a decreasing pitch to straighten blood flowing out of the pump.
8. The axial flow rotary blood pump of claim 1, wherein said pump is spiderless and sealless.
9. The axial flow rotary blood pump of claim 1, wherein said impeller, when in use, experiences retrograde blood flow around its periphery.
10. A blood pump as previously described in the specification with reference to any one of the accompanying figures.